CLAIMS

1.   An eye tracking apparatus for detecting an eye in image data obtained in chronological order by picking up images of a face and tracking the detected eye, comprising:

a threshold storing unit for storing a threshold;

a tracking area storing unit for storing a tracking area; and

a controller, capable of performing operations of:

identifying a first area of an eye in image data;

causing the tracking area storing unit to store the identified fist area as a tracking area;

identifying a second area of an eye in image data subsequent to the image data on the basis of the tracking area stored in the tracking area storing unit;

calculating a correlation value between the tracking area and the second area; and

comparing the calculated correlation value with the threshold stored in the threshold storing unit,

wherein the tracking area storing unit stores the second area identified by the controller as a tracking area when a comparison result by the computer indicates that the correlation value is larger than the threshold.

2.   The eye tracking apparatus according to Claim 1, wherein the controller identifies a second area in a proximity area of

the tracking area in the subsequent image data.

3.   The eye tracking apparatus according to Claim 1, wherein the controller is further capable of extracting characteristic data of the tracking area and the second area, and calculates a correlation value between the characteristic data of the extracted tracking area and the characteristic data of the extracted second area.

4.   The eye tracking apparatus according to Claim 1, wherein the controller is further capable of detecting a change between the tracking area and the second area, and the tracking area storing unit stores the second area as a tracking area when the controller detects a change.

5.   An eye tracking apparatus for detecting an eye in image data obtained in chronological order by picking up images of a face and tracking the detected eye, comprising:

threshold storing means for storing a threshold;

first identifying means for identifying a first area of an eye in image data;

tracking area storing means for storing the fist area identified by the first identifying means as a tracking area;

second identifying means for identifying a second area of an eye in image data subsequent to the image data on the basis of the

tracking area stored in the tracking area storing means;

calculating means for calculating a correlation value between the tracking area and the second area; and

comparing means for comparing the correlation value calculated by the calculating means with the threshold stored in the threshold storing means,

wherein the tracking area storing means stores the second area identified by the second identifying means as a tracking area when a comparison result by the comparing means indicates that the correlation value is larger than the threshold.

6.   The eye tracking apparatus according to Claim 5, wherein the second identifying means identifies a second area in a proximity area of the tracking area in the subsequent image data.

7.   The eye tracking apparatus according to Claim 5, further comprising extracting means for extracting characteristic data of the tracking area and the second area, wherein the calculating means calculates a correlation value between the characteristic data of the tracking area extracted by the extracting means and the characteristic data of the second area extracted by the extracting means.

8.   The eye tracking apparatus according to Claim 5, further comprising change detecting means for detecting a change between

the tracking area and the second area, wherein the tracking area storing means stores the second area as a tracking area when the change detecting means detects a change.

9. An eye tracking method for detecting, with a computer, an eye in image data obtained in chronological order by picking up images of a face and tracking the detected eye, comprising steps of:

storing a threshold;

identifying a first area of an eye in image data;

storing the identified first area as a tracking area;

identifying a second area of an eye in image data subsequent to the image data on the basis of the tracking area;

calculating a correlation value between the tracking area and the second area;

comparing the calculated correlation value with the threshold; and

storing the second area as a tracking area when a comparison result indicates that the correlation value is larger than the threshold.

10. A computer memory product having computer readable program means for causing a computer to detect an eye in image data obtained in chronological order by picking up images of a face and to track the detected eye, said program code means comprising:

program code means for causing the computer to store a

threshold;

program code means for causing the computer to identify a first area of an eye in image data;

program code means for causing the computer to store the identified first area as a tracking area;

program code means for causing the computer to identify a second area of an eye in image data subsequent to the image data on the basis of the tracking area;

program code means for causing the computer to calculate a correlation value between the tracking area and the second area;

program code means for causing the computer to compare the calculated correlation value with the threshold; and

program code means for causing the computer to store the second area as a tracking area when a comparison result indicates that the correlation value is larger than the threshold.

11.   An eye state judging apparatus for detecting an eye in image data obtained by picking up an image of a face and judging an open/close state of the detected eye, comprising a controller capable of performing operations of:

identifying an eye area in the image data;

detecting the shape of a lid in the identified eye area; and

judging an open/close state of the eye on the basis of the detected shape of the lid.

12. The eye state judging apparatus according to Claim 11, wherein the controller is further capable of calculating a function which indicates the shape of the lid, and judges the open/close state of the eye on the basis of the calculated function.

13. An eye state judging apparatus for detecting an eye in image data obtained by picking up an image of a face and judging an open/close state of the detected eye, comprising:

identifying means for identifying an eye area in the image data;

lid detecting means for detecting the shape of a lid in the eye area identified by the identifying means; and

judging means for judging an open/close state of the eye on the basis of the shape of the lid detected by the lid detecting means.

14. The eye state judging apparatus according to Claim 13,

wherein the lid detecting means includes function calculating means for calculating a function which indicates the shape of the lid, and

the judging means judges the open/close state of the eye on the basis of the function calculated by the function calculating means.

15. An eye state judging method for detecting, with a computer, an eye in image data obtained by picking up an image of a

face and judging an open/close state of the detected eye, comprising steps of:

    identifying an eye area in the image data;

    detecting the shape of a lid in the identified eye area; and

    judging an open/close state of the eye on the basis of the detected shape of the lid.

    16.   A computer memory product having computer readable program code means for causing a computer to detect an eye in image data obtained by picking up an image of a face and to judge an open/close state of the detected eye, said program code means comprising:

    program code means for causing the computer to identify an eye area in the image data;

    program code means for causing the computer to detect the shape of a lid in the identified eye area; and

    program code means for causing the computer to judge an open/close state of the eye on the basis of the detected shape of the lid.